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ABSTRACT

With few exceptions, virtually all research on the etiology of adolescent substance abuse has focused entirely on identifying risk factors while ignoring protective factors that insulate teenagers from drug involvement. This perspective fails to consider that protective forces may operate in both direct and interactive ways. This longitudinal study tested new approaches that consider a wide range of factors in indices of risk, protection, and their interaction. Analyses are based on two waves of data collected in a 12-year longitudinal study of adolescent and adult development and drug use. In year 5, data were collected from 896 late adolescents (grades 11, 12, and post high school). Multiple items of three specific types of drug problems were used to reflect general latent constructs of alcohol problems, cannabis problems, and cocaine problems. The three specific types of problems were assessed by the frequency of occurrence of various adverse consequences attributable to drug use. Bivariate, multiple regression, and latent-variable structural equation analyses were used to examine the relationships between vulnerability (risk, protection, and their interaction), and frequency and quantity of drug use (cigarettes, alcohol, cannabis, cocaine, and hard drugs), and between vulnerability and problems related to drug use 8 years later. Vulnerability in adolescence was found to have both a direct and indirect influence, and lead to problem use of cannabis, alcohol, and cocaine in adulthood. (LLL)

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# Protective/Risk Factors for Problem Drug Use: A Longitudinal Analysis

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Abstract

We test new approaches that overcome the problem of attempting to identify single causes of substance abuse by considering a wide range of factors in indices of risk, protection, and their interaction. From data on a sample of teenagers, bivariate, multiple regression, and latent-variable structural equation analyses were used to examine the relationships between Vulnerability (risk, protection, and their interaction) and frequency and quantity of drug use (cigarettes, alcohol, cannabis, cocaine, and hard drugs) in adolescence and between Vulnerability and problems related to drug use eight years later. Vulnerability in adolescence directly increased problems with cannabis eight years later.

## Protective/Risk Factors for Problem Drug Use:
## A Longitudinal Analysis

With few exceptions, virtually all research on the etiology of adolescent substance abuse has focused entirely on identifying risk factors while ignoring protective factors, those that insulate teenagers from drug involvement. This narrow focus stems from an assumption that those who are not at high risk for using drugs are by default protected. The possibility that certain factors may be unequally or more powerfully protective than risk-inducing is not examined. Further, this perspective fails to consider and appreciate that protective forces may operate in both direct (as main effects) and interactive ways (as moderators or buffers of risk).

In this study, we include in our analyses frequency of use for five different drugs, quantity assessments, and problem use (see figure). Use of multiple drugs is a latent construct of polydrug use that reflects the extent of involvement (frequency and quantity) with all five drugs in a structural model equation (SEM). Finally, to capture more accurately the extent of severe drug problems that emerge after several years of drug use or abuse, we include in our analyses multi-item scales of physical, social, and work consequences due to alcohol, cannabis, and cocaine use. We examine separate indices of risk, protection, and their moderating effects as predictors of various types of drug abuse at two time intervals: cross-sectionally and eight years later.

## Method

### Subjects

Analyses are based on two waves of data collected in a 12-year longitudinal study of adolescent and adult development and drug use (Newcomb, 1989; Newcomb & Bentler, 1988). In Year 5, data were collected from 896 late adolescents (grades 11, 12, and post high school; see Table 1). There remained 536 subjects in Year 13.

### Measures

Multiple items of three specific types of drug problems (problems at work, social problems, and physical problems) were used to reflect general latent constructs of Alcohol Problems, Cannabis Problems, and Cocaine Problems. The three specific types of problems were assessed by the frequency of occurrence of various adverse consequences attributable to drug use. These multiple items of three specific types of drug use were rated separately for each drug. This measure is described in detail elsewhere (Newcomb & Bentler, 1990; Stacy, Newcomb, & Bentler, in preparation).

We created two distinct indices by assigning each psychosocial factor to either the Risk Factor Index (RFI) or the Protective Factor Index (PFI) based on the strongest correlation. For more details on the construction of these indices, see Newcomb and Felix-Ortiz, in preparation (see Table 2 and 3).

## Results and Discussion

### Cross-sectional mean comparisons and multiple regression analyses

Table 4 presents Year 5 drug measures and the indices by sex. Table 5 presents correlations between the indices and the drug use

frequency and quantity measures: the RFI and PFI were negatively correlated with each other ($r=-.31$, $p<.001$). Table 6 and 7 present multiple regression analyses. The PFI x RFI interaction was entered last into hierarchical multiple regression analyses and was significant only in a few equations: hard drug use for both sexes, cocaine use and cigarette quantity for females, and cannabis quantity for males. More detailed analyses of these tables is presented elsewhere (Newcomb & Felix-Ortiz, in preparation).

SEM

Three first-order latent drug use factors were hypothesized to underlie six variables at Year 5. These three factors and frequency measures for cocaine and hard drugs were hypothesized to reflect a second-order latent factor of Polydrug Use (PDU). Vulnerability was hypothesized to underlie the RFI, PFI, and their interaction variable; Vulnerability was allowed to covary with Year 5 PDU. At Year 13, three latent constructs representing problems associated with drug use were hypothesized to underlie three indicators each. In the initial SEM: 1) Year 13 latent constructs were predicted by Year 5 PDU and Vulnerability; 2) correlated within-time residuals for similar measures; and 3) correlated across-time disturbances for Year 9 constructs.

This initial model fit the data reasonably well. Additional parameters were selected with the Lagrange Multiplier modification index while nonsignificant parameters were deleted as per the multivariate Wald test (Bentler & Chou, 1986). This final SEM fit well, $X^2(124, N = 536) = 190$, NFI=.97, CFI = .99 (see figure). Factor

loadings for the Year 5 first-order latent constructs ranged from .36 to .95 and from .58 to .92 for Year 5 PDU. The disturbance variables for both Year 5 Alcohol Use and Year 5 Cannabis Use significantly increased Alcohol and Cannabis Problems. Year 5 PDU directly increased Cocaine Problems. Vulnerability directly increased Cannabis Problems. Vulnerability also increased four of the Year 13 indicators: alcohol problems, physical; cannabis problems, work; cocaine problems, physical; and cocaine problems, social (see Table 8). The residual of the RFI significantly increased Alcohol and Cannabis Problems. The residual of the PFI and of the interaction increased Alcohol Problems.

Vulnerability in adolescence has both direct and indirect influences and leads to problem use of cannabis, alcohol, and cocaine in adulthood.

References

Bentler, P. M., & Chou, C.-P. (1986, April). Statistics for parameter expansion and contraction in structural models. Paper presented at American Educational Research Association meeting, San Francisco, CA.

Newcomb, M. D. (1989). Understanding the multidimensional nature of drug use and abuse: The role of consumption, risk factors, and protective factors. Paper presented at the meeting of the NIDA/APA Technical Review Meeting on the Transition from Drug Use to Abuse/Dependence.

Newcomb, M. D., & Bentler, P. M. (1988). Consequences of adolescent drug use: Impact on the lives of young adults. Newbury Park, CA: Sage.

Newcomb, M. D., & Bentler, P. M. (1990). Understanding the multidimensional nature of drug use and abuse: The role of consumption, risk factors, and protective factors. Paper presented at the meeting for the NIDA/APA Technical Review Meeting on the Transition from Drug Use to Abuse/Dependence, November, 1989.

Newcomb, M. D., & Felix-Ortiz, M. (in preparation). Multiple protective and risk factors for drug use and abuse: Cross-sectional and longitudinal analyses.

Newcomb, M. D., Maddahian, E., & Bentler, P. M. (1986). Risk factors for drug use among adolescents: Concurrent and longitudinal analyses. American Journal of Public Health, 76, 525-531.

Stacy, A. W., Newcomb, M. D., & Bentler, P. M. (in preparation).

Cognitive motivation and drug use: A nine-year longitudinal study.

Stacy, A. W., Newcomb, M. D., & Bentler, P. M. (in preparation). Personality, problem drinking, and drunk driving: Mediating, moderating, and direct effect models.

Table 1

Sample Description of Late Adolescents (Year 5)

| Variable | Male N | Male % | Female N | Female % |
|---|---|---|---|---|
| | | Grade | | |
| 11 | 127 | 43.6 | 245 | 40.5 |
| 12 | 102 | 35.1 | 214 | 35.4 |
| graduate | 62 | 21.3 | 146 | 24.1 |
| | | Ethnicity | | |
| Hispanic | 37 | 12.7 | 80 | 13.2 |
| Black | 43 | 14.8 | 109 | 18.0 |
| Asian | 20 | 6.9 | 47 | 7.8 |
| White | 191 | 65.6 | 369 | 61.0 |
| Total | 291 | 32.5 | 605 | 67.5 |

Table 2

Cutpoints for the Protective and Risk Factors

| Factors | Variable Range | Cutpoint for Index | Percent of Sample |
|---|---|---|---|
| | | Protective Factors | |
| grade point average | 1-4 | A | 11.8[a] |
| law abidance | 4-20 | >16 | 21.1 |
| religiosity | 4-20 | >19 | 18.3 |
| depression | 4-20 | =4 | 18.9 |
| self-acceptance | 4-20 | >18 | 24.6 |
| home relationships | 8-40 | >36 | 21.0 |
| sanctions against drug use | 6-30 | >23 | 21.9 |
| | | Risk Factors | |
| educational aspiration | 1-6 | <3 | 15.1 |
| perceived opportunity | 3-15 | <10 | 16.6 |
| deviance | 0-42 | >6 | 20.8 |
| important people/ community support | 12-53 | >27 | 21.1 |
| perceived adult drug use | 9-34 | >19 | 20.5 |
| perceived peer drug use | 9-35 | >20 | 18.5 |
| availability of drugs | 6-30 | >28 | 21.0 |

[a]cutoff closest to 20% given the variable's distribution

Table 3

Sample Distribution for Protective and Risk Factor Indices

| Protective | | | | Risk | | | |
|---|---|---|---|---|---|---|---|
| Number | Percent of Sample | | | Number | Percent of Sample | | |
| | Total | Male | Female | | Total | Male | Female |
| 0 | 35.8 | 21.1 | 19.0 | 0 | 44.6 | 19.6 | 27.3 |
| 1 | 24.6 | 22.3 | 20.3 | 1 | 24.9 | 19.9 | 22.3 |
| 2 | 19.3 | 16.5 | 17.2 | 2 | 13.9 | 18.9 | 15.5 |
| 3 | 9.3 | 16.2 | 14.5 | 3 | 10.1 | 14.1 | 13.1 |
| 4 | 5.8 | 9.3 | 9.6 | 4 | 4.1 | 10.3 | 8.4 |
| 5 | 3.1 | 6.9 | 7.4 | 5 | 2.1 | 7.2 | 6.1 |
| 6 | 2.0 | 4.1 | 5.1 | 6 | 0.2 | 4.1 | 3.3 |
| 7 | 0.2 | 2.7 | 3.0 | 7 | 0 | 0 | 0 |

Table 4

Mean Sex Comparisons on the Year 5 Drug Use Measures and Risk and Protective Factor Indices

| Variable | Males | Females | F |
|---|---|---|---|
| Frequency of Use Over Six Months | | | |
| Cigarettes | 2.25 | 2.56 | 3.59+ |
| Alcohol | 7.83 | 7.31 | 3.90* |
| Cannabis | 4.35 | 3.91 | 4.80* |
| Cocaine | 1.42 | 1.40 | 0.11 |
| Hard Drugs | 15.12 | 15.23 | 0.20 |
| Quantity of Drug Use | | | |
| Cigarettes | 1.39 | 1.65 | 10.67*** |
| Alcohol | 2.98 | 2.38 | 16.45*** |
| Cannabis | 1.83 | 1.46 | 13.47*** |
| Protective Factor Index | 1.30 | 1.11 | 4.11* |
| Risk Factor Index | 1.30 | 1.41 | 1.05 |

+$p \leq .10$ *$p \leq .05$ **$p \leq .01$ ***$p \leq .001$

Table 5

Correlations of the Protective Factor Index and Risk Factor Index With Different Dependent Measures

| Variable | Total Sample | Males | Females | Z-Diff |
|---|---|---|---|---|
| | | Frequency of Use Over the Last Six Months | | |
| PFI | | | | |
| Cigarettes | -.27 | -.15 | -.31 | 2.36** |
| Alcohol | -.35 | -.31 | -.37 | 0.95 |
| Cannabis | -.32 | -.29 | -.33 | 0.62 |
| Cocaine | -.22 | -.20 | -.23 | 0.44 |
| Hard Drugs | -.22 | -.23 | -.22 | -0.15 |
| RFI | | | | |
| Cigarettes | .42 | .38 | .44 | -1.01 |
| Alcohol | .51 | .50 | .52 | 0.38 |
| Cannabis | .64 | .64 | .64 | 0 |
| Cocaine | .56 | .51 | .59 | -1.60 |
| Hard Drugs | .50 | .54 | .50 | 0.77 |
| | | Quantity of Drug Use | | |
| PFI | | | | |
| Cigarettes | -.21 | -.04(NS) | -.27 | 3.31*** |
| Alcohol | -.35 | -.36 | -.35 | -0.16 |
| Cannabis | -.27 | -.19a | -.32 | 1.94* |
| RFI | | | | |
| Cigarettes | .36 | .35 | .39 | -0.65 |
| Alcohol | .44 | .41 | .45 | -0.69 |
| Cannabis | .59 | .60 | .59 | 0.22 |

Note: all correlations are significant at the .001 level except where otherwise indicated. a=$p \leq .01$.

Table 6

Multiple Regression Analyses of the Protective and Risk Factor Indices for Different Dependent Measures

| Variable | Beta Weights PFI | Beta Weights RFI | $R^2$ |
|---|---|---|---|
| **Frequency of Use Over the Last Six Months** | | | |
| Total Group | | | |
| Cigarettes | -.16*** | .37*** | .20*** |
| Alcohol | -.22*** | .45*** | .31*** |
| Cannabis | -.13*** | .60*** | .43*** |
| Cocaine | -.05+ | .55*** | .32*** |
| Hard Drugs | -.07* | .48*** | .26** |
| Males | | | |
| Cigarettes | -.07 | .36*** | .15*** |
| Alcohol | -.21*** | .45*** | .29*** |
| Cannabis | -.15** | .61*** | .43*** |
| Cocaine | -.09+ | .49*** | .27*** |
| Hard Drugs | -.11* | .52*** | .31*** |
| Females | | | |
| Cigarettes | -.18*** | .38*** | .22*** |
| Alcohol | -.22*** | .44*** | .31*** |
| Cannabis | -.13*** | .60*** | .43*** |
| Cocaine | -.03 | .58*** | .35*** |
| Hard Drugs | -.05 | .49*** | .26*** |
| **Quantity of Drug Use** | | | |
| Total Group | | | |
| Cigarettes | -.11*** | .33*** | .14*** |
| Alcohol | -.24*** | .37*** | .25*** |
| Cannabis | -.10*** | .56*** | .36*** |
| Males | | | |
| Cigarettes | .04 | .36*** | .13*** |
| Alcohol | -.28*** | .35*** | .24*** |
| Cannabis | -.05 | .59*** | .37*** |
| Females | | | |
| Cigarettes | -.15*** | .34*** | .17*** |
| Alcohol | -.22*** | .38*** | .25*** |
| Cannabis | -.13*** | .54*** | .36*** |

Note: The significance of R-squared is based on the F-value.
The significance of beta weights are based on the t-value.
***$p \leq .001$ **$p \leq .01$ *$p \leq .05$ +$p \leq .10$

Table 7

Multiple Stepwise Regression of Indices and their Interaction on the Various Dependent Measures

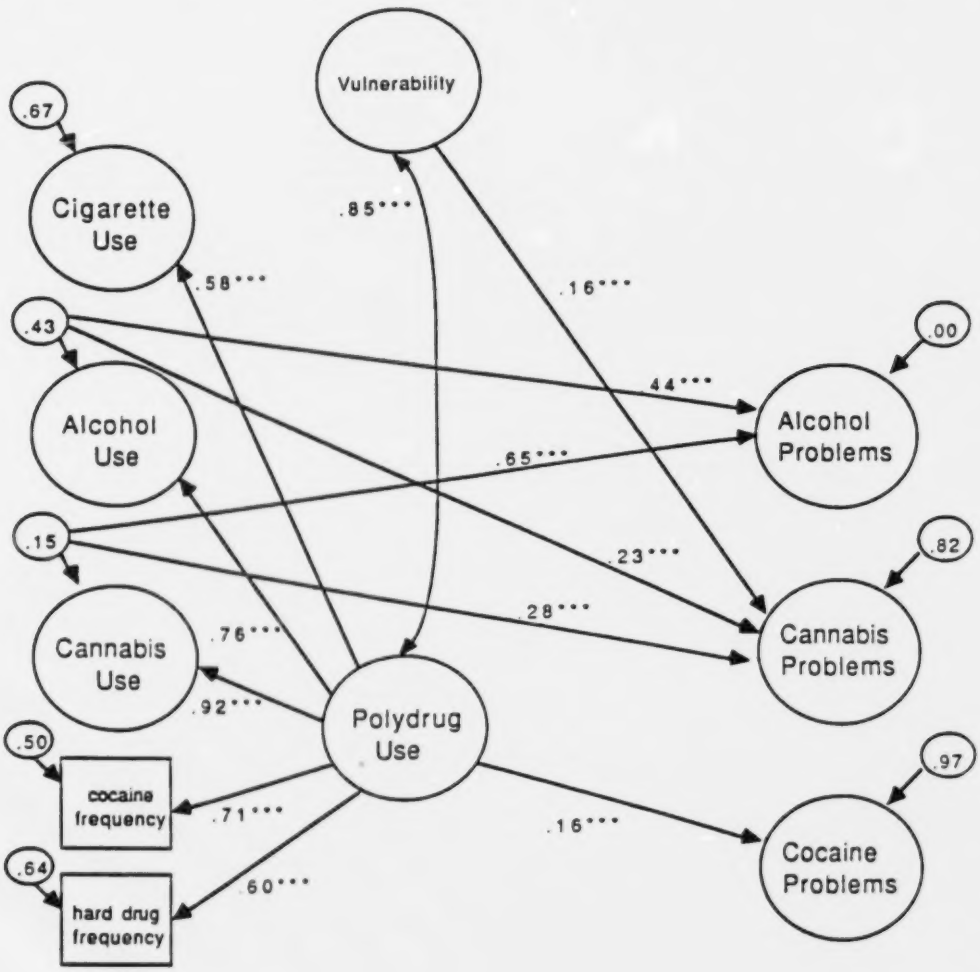
| Variable | Males | | Females | |
|---|---|---|---|---|
| | Incremental $R^2$ | $R^2$ | Incremental $R^2$ | $R^2$ |
| **Frequency of Use Over the Last Six Months** | | | | |
| Cigarettes | | | | |
| PFI | .024*** | .024*** | .096*** | .096*** |
| RFI | .126*** | .150*** | .129*** | .225*** |
| RxP | .001 | .150*** | .003 | .228*** |
| Alcohol | | | | |
| PFI | .097*** | .097*** | .135*** | .135*** |
| RFI | .193*** | .290*** | .173*** | .308*** |
| RxP | .006 | .296*** | .001 | .309*** |
| Cannabis | | | | |
| PFI | .086*** | .086*** | .107*** | .107*** |
| RFI | .347*** | .433*** | .319*** | .426*** |
| RxP | .001 | .434*** | .001 | .427*** |
| Cocaine | | | | |
| PFI | .039** | .039** | .053*** | .053*** |
| RFI | .229*** | .268*** | .298*** | .351*** |
| RxP | .002 | .270*** | .011*** | .362*** |
| Hard Drugs | | | | |
| PFI | .054** | .054** | .042*** | .047*** |
| RFI | .254*** | .308*** | .209*** | .256*** |
| RxP | .035** | .343*** | .052*** | .308*** |
| **Quantity of Use Measure** | | | | |
| Cigarettes | | | | |
| PFI | .002 | .002 | .070*** | .070*** |
| RFI | .123*** | .125*** | .100*** | .170*** |
| RxP | .001 | .126*** | .005+ | .175*** |
| Alcohol | | | | |
| PFI | .186*** | .128*** | .120*** | .120*** |
| RFI | .113*** | .241*** | .128*** | .248*** |
| RxP | .003 | .244 | .000 | .248*** |
| Cannabis | | | | |
| PFI | .036** | .036** | .101*** | .101*** |
| RFI | .330*** | .366*** | .261*** | .362*** |
| RxP | .005 | .371*** | .002 | .364*** |

Table 8

Across time Influences of Latent and Observed Variables in the Final Structural Model For Disruptive Use Over Eight Years

| Adolescent Predictor Variable | | Adult Consequent Variable | | Standardized Parameter Estimate[a] |
|---|---|---|---|---|
| Observed | Latent | Observed | Latent | |
| | Vulnerability | alcohol problems, physical | | .09*** |
| | Vulnerability | cannabis problems, work | | .04* |
| | Vulnerability | cocaine problems, physical | | .07** |
| | Vulnerability | cocaine problems, social | | .09** |
| RFI (R) | | | alcohol problems | .52*** |
| RFI (R) | | | cannabis problems | .15** |
| PFI (R) | | | alcohol problems | -.10** |
| RFI x PFI (R) | | | alcohol problems | .16*** |
| | Cigarette Use (R) | cannabis problems, physical | | .06* |
| cigarette frequency (R) | | | alcohol problems | .19* |
| | Alcohol Use (R) | alcohol problems, physical | | .20*** |
| | Alcohol Use (R) | cocaine problems, physical | | .08*** |
| | Cannabis Use (R) | cannabis problems, work | | .18*** |
| | Cannabis Use (R) | cocaine problems, physical | | .06** |
| cannabis frequency (R) | | alcohol problems, social | | .07* |
| cannabis frequency (R) | | cannabis problems, physical | | .16** |
| cannabis quantity (R) | | cannabis problems, physical | | .16*** |
| cocaine frequency (R) | | | alcohol problems | .22*** |
| hard drug frequency (R) | | cannabis problems, work | | .07** |

Note: (R) = variable residual; [a]significance level determined by a critical ratio of the unstandardized parameter estimate divided by its standard error; *p≤.05, **p≤.01, ***p≤.001. RFI = Risk Factor Index, PFI = Protective Factor Index.


----------YEAR 5----------
----YEAR 13----
Vulnerability
.67
Cigarette Use
.85***
.58***
.16***
.43
.00
.44***
Alcohol Use
Alcohol Problems
.65***
.15
.82
.23***
.28***
Cannabis Use
.76***
Cannabis Problems
.92***
Polydrug Use
.50
.97
cocaine frequency
.71***
.16***
Cocaine Problems
.64
hard drug frequency
.60***